Chalmette Refining, L.L.C.
FCC-ALKY Units Title V Application

"IT" QUESTIONS

To demonstrate that any potential environmental impacts resulting from the proposed projects associated with the FCC-ALKY Units are considered and minimized, the following five "Environmental Impact Questions" have been addressed. The "Environmental Impact Questions" are based on the expanded "IT Decision" questions published on the LDEQ website.

I. Have the potential and real adverse environmental effects of the proposed facility been avoided to the maximum extent possible?

Yes. Chalmette Refining currently operates the equipment in the FCC-ALKY Units efficiently to reduce emissions. The proposed projects will reduce nitrogen oxide (NOx) emissions and will not change the basic operation of the units; the only external added equipment will be an aqueous ammonia storage vessel, utility connections (electricity, steam and hydrogen) and piping components. The aqueous ammonia will be stored in a pressurized storage vessel with a dedicated containment area and surrounding dyke wall. The vapor space in the vessel above the liquid will contain nitrogen gas with a pressure safety relief connection to the flare to minimize emissions. The existing heaters utilize clean burning refinery fuel gas which results in reduced emissions compared to other fuel sources. The proposed project will utilize a patented process to reduce nitrogen oxide emissions in the regenerator vent. In addition, the regenerator vent has an existing wet gas scrubber that also reduces emissions released to the atmosphere. The FCC catalyst loading and unloading operations use dust control containment devices to reduce the release of particulate emissions to the atmosphere.

A. What are the potential environmental impacts of the permittee's proposed facility?

The emissions resulting from the FCC-ALKY Units as well as the proposed project is controlled to the levels required by applicable regulations. The estimated emissions due to the operation of the associated equipment are based on conservative engineering design calculations or established and approved emission factors. Sections II, III, IV and V of the permit application detail the emission calculations and state and federal regulatory requirements, respectively, for the FCC-ALKY Units sources. These sections show that all affected process equipment will comply with all applicable control and regulatory requirements.

With respect to land impacts, the site of the FCC-ALKY Units is currently zoned as an industrial area. Additionally, no new highway, onsite or offsite construction

is required for the FCC-ALKY Units. The proposed project will require the addition of an ammonia storage tank.

Solid wastes generated due to equipment in the FCC-ALKY Units are handled appropriately. Any solid or hazardous waste produced are treated or disposed of in accordance with all applicable Federal, State, and local laws and regulations. There will be no onsite treatment or disposal of solid and/or hazardous wastes.

The FCC-ALKY Units do not produce significant volumes of wastewater requiring treatment in the existing Waste Water Treatment System, which complies with the associated Chalmette Refining Louisiana Pollutant Discharge Elimination System (LPDES) permit limits. Additionally, stormwater falling outside process areas is managed under the existing LPDES permit. Stormwater is routed through collection facilities and discharged to the Mississippi River in accordance with the current LPDES permit limits. Any water required for the FCC-ALKY Units equipment is obtained from the existing refinery water treating systems that obtain water from the Mississippi River.

There are no significant ecological impacts expected from operation of equipment in the FCC-ALKY Units. There are no state or federal rare, threatened, or endangered species located at the site. The site does not feature or contain aesthetic, archaeological or cultural resources, or jurisdictional wetlands and is not situated in the 100-year floodplain.

Continued operation of the FCC-ALKY Unit equipment will likely result in positive socioeconomic impacts on the local, regional, and state economy through wages, operational and capital spending, and tax revenues.

1. **What wastes will be handled?**

   The FCC-ALKY Units generate solid waste from operation of the associated equipment. The proposed projects will generate relatively minimal volumes of solid waste. Additionally, small amounts of potentially hazardous wastes are generated from operations of the process equipment including heaters and reactors. The wastes include spent solvents from maintenance painting activities, degreasing operations and equipment washout, as well as used lubrication oils and spent catalyst.

2. **How will they be handled?**

   The FCC-ALKY Units as well as the proposed projects generate both solid and hazardous wastes which will temporarily be stored on-site in accordance with all applicable Federal and State regulations prior to transport of these wastes off-site to an authorized treatment, storage, recycling, or disposal facility. There will be no on-site treatment or disposal of solid and/or hazardous wastes.

Additionally, Chalmette Refining is subject to the provisions of LAC 33:VII.701 which applies to generators of industrial solid waste. As an industrial waste generator, Chalmette Refining submits an annual waste generation report to LDEQ.

3. **Sources of waste**

All solid and/or hazardous wastes handled on-site will be generated from on-site sources. No solid and/or hazardous wastes will be received from off-site.

4. **Where will the wastes be shipped if not handled at this site?**

There will be no on-site treatment and/or disposal of solid and/or hazardous waste at the refinery. Chalmette Refining encourages waste minimization practices to the maximum extent practicable. However, in the event solid and/or hazardous wastes are generated, they are transported to an authorized off-site treatment, disposal, or recycling facility.

5. **What wastes will remain on-site permanently?**

No wastes will remain on-site permanently. All solid and hazardous wastes will be treated, disposed, or recycled at an off-site facility in accordance with all Federal, State, and local regulations.

B. By which of the following potential pathways could releases of hazardous materials from the proposed facility endanger local residents or other living organisms?

1. **Air**

Air emissions from the current operation of the FCC-ALKY Units as well as the proposed projects include emissions of PM_{10}, CO, SO_2, NO_x, VOC and ammonia. Emissions of these compounds are effectively controlled using good design, efficient burners, clean fuels for combustion, patented NO_x reduction system, wet gas scrubber and enhanced LDAR monitoring.

Additionally, toxic air pollutant (TAP) emissions associated with the FCC-ALKY Units as well as the proposed projects will not likely endanger human health or the environment, since Maximum Achievable Control Technology (MACT) will be applied to the fugitive components within the FCC-ALKY Units. Additionally, MACT is applied at the facility to all emission sources that emit Class I or II TAPs and also meet MACT applicability requirements.

2. **Water**

Water discharges are authorized and regulated in accordance with Chalmette Refining's LPDES permit, which includes the FCC-ALKY Units. The

LPDES permit limits currently incorporate Best Practicable Technology (BPT) under the State and Federal Clean Water Acts and comply with all State surface water quality standards. The refinery complies with its current LPDES permit limits, therefore ensuring that downstream drinking water supply intakes will not be adversely affected.

3. **Soil**

Releases to soils from the FCC-ALKY Units as well as the proposed projects are unlikely due to the design of the facilities (i.e., equipment is located on foundations, there are no land-based waste management units, and Spill Prevention and Control Plans are in place). Therefore, this is an unlikely pathway for impacts to human health and the environment.

4. **Food**

This is an unlikely pathway for impacts to human health and the environment since there are no food supplies associated with operation of the refinery. Additionally, no agricultural or livestock activities are planned for the site.

C. What is the likelihood or risk potential of such releases?

Chalmette Refining takes all reasonable actions to prevent and/or minimize the likelihood or risk of potential releases. Additionally, state-of-the-art air emission control mechanisms are employed at the refinery to ensure that uncontrolled chemical releases to the air are avoided to the maximum extent possible. Likewise, process wastewater is captured and hard-piped to treatment facilities and treated using Best Practicable Technology (BPT) requirements to meet LPDES permit limits prior to discharge.

Emergency preparedness plans that have been or will be implemented at the refinery includes:

- Spill Prevention, Control and Countermeasure (SPCC) Plan;
- Stormwater Pollution Prevention Plan (SWP3);
- Risk Management Plan (RMP) under the federal Clean Air Act Amendments of 1990; and
- Process Safety Plan and Hazards Analysis under rules of the U.S. Occupational Safety and Health Administration.

D. What are the real adverse environmental impacts of the permittee's proposed facility?

The emissions resulting from the operation of the FCC-ALKY Units as well as the proposed projects are controlled to the levels required by applicable regulations. Likewise, the current LPDES permit limits include the operation of the FCC-ALKY Units; thus, Best Practicable Technology requirements are being

met. Therefore, there will be no expected significant adverse impacts to human health and the environment due to the continued operation of the FCC-ALKY Units as well as the proposed project, which will reduce permitted NOx emissions by more than 200 tons per year.

1. Short-term effects

There are no anticipated short-term adverse environmental impacts associated with the continued operation of the FCC-ALKY Units equipment as well as the proposed projects.

a. Land area taken out of the system

Since the entire facility is an industrial area, the land use within the facility will not change.

2. Long-term effects

Long-term impacts from these emissions and discharges are not expected to be adverse since they are regulated under state permits and subject to control technologies.

II. Does a cost benefit analysis of the environmental impact costs balanced against the social and economic benefits of the proposed facility demonstrate that the latter outweighs the former?

Yes. The social and economic benefits associated with operation of the FCC-ALKY Units as well as the proposed projects outweigh the minor environmental impacts. The equipment is in an existing refinery. As described in the response to Question I, impacts to the air and water are well addressed and minimized to the extent possible. Operations of this type are considered to produce distinct socioeconomic impacts. First, the operation phase will produce economic benefits for the community by generating additional revenue through direct wages and the spending of those wages within the local community. Additionally, Chalmette Refining provides important economic benefits to St. Bernard Parish and the state of Louisiana.

Operation of the FCC-ALKY Units as well as the proposed projects require the equivalent of approximately 50-60 jobs with an estimate of about $2-4 million being paid out as wages. An additional estimated economic stimulus is attributable to the payment for replacement equipment and services.

Chalmette Refining is also committed to improving environmental performance of the facility, which is demonstrated by the investment of more than $200 million in environmental projects including:

1. The Thermal De-NOx Project that will decrease permitted NOx emissions by more than 200 tons per year.

2. A flare gas management project that will reduce gases to the flare leading to reduced emissions. The system will reduce emissions by approximately 1,200 tons of sulfur dioxide per year.

3. Low sulfur motor gasoline and diesel projects that will reduce the sulfur content of motor gasoline and on-road diesel by at least 90%.

4. Upgrades to heaters and boilers within the facility that will decrease nitrogen dioxide emissions by approximately 400 tons per year.

5. Enhancements to the Leak Detection and Repair (LDAR) and Benzene Waste Operations programs that will reduce VOC emissions from fugitive sources.

6. A new, state-of-the-art wastewater treatment plant that enables the refinery to process rainfall from a "25-year" storm in three days versus the current three weeks to prevent unintentional discharges into the river.

Some of the benefits that Chalmette Refining provides to the local community include the following.

1. An Enhanced Ambient Air Quality Monitoring Program in St. Bernard Parish has been implemented, in collaboration with LDEQ, to collect additional ambient air monitoring data to be utilized in evaluating the air quality in the area and aid in identifying potential sources of emissions of air pollutants. The data collected from the monitors is also made available to the public through a DEQ St. Bernard Parish Ambient Air Monitoring Webpage, and the results are compared to the appropriate standards that have been established to ensure the protection of public health.

2. Contributions:

   Sponsorships and outreach efforts: Chalmette Refining contributes more than $250,000 per year to the community through annual sponsorships, contributions and outreach efforts.

   Volunteering: Chalmette Refining employees, retirees and family members volunteer more than 11,000 hours annually to their local communities, earning an additional $200,000 in Volunteer Involvement Program grants.

   United Way: Chalmette Refining Employees and ExxonMobil Foundation contribute over $250,000 annually to the United Way of Greater New Orleans.

   Funding for grants: Chalmette Refining, through the management of the Greater New Orleans Foundation, provides funding for grants averaging $30,000 to $50,000 annually to non-profit organizations in Algiers and St. Bernard Parishes.

3. Ongoing outreach programs:

Near Neighbors

Resident Odor Observer: In addition to a trained odor patrol comprised of refinery employees and a detailed neighborhood inquiry response and tracking system, many near-neighbors have been trained to detect and quantify refinery odors on the Butanol Scale.

Neighborhood Turnaround Notices: Prior to major turnaround activity, the refinery distributes written communication to all of St. Bernard Parish and Lower Algiers on the Westbank reviewing the potential for increased traffic, noise, flaring, and odors during refinery turnarounds.

Community Hotline: A recorded message is available 24 hours a day for residents to call about refinery operations. Used mostly to explain current refinery operations, the hotline is most effective during situations having the potential to cause offsite impacts and/or situations requiring emergency response.

Community Communication: The refinery Title V permit applications are being discussed in general with the Community Advisory Committee, and additional meetings will be scheduled as needed to communicate further details. Additionally, quarterly communications are distributed to both communities in the form of various information brochures and advertisements. The development of a Community Newsletter is also under consideration.

First Call System: Financed by the refinery and administered by parish officials, the First Call System is an emergency notification system which utilizes recorded messages via phone calls to alert residents of an emergency situation at the refinery or in the parish (e.g. sheltering in place). Chalmette Refining has worked in conjunction with the local fire department on an ongoing community education program that informs residents of the First Call System, which includes instructions on sheltering in place.

Community Survey: The refinery currently conducts a survey of residents concerning their perceptions of the refinery every two years.

Fire Department: Chalmette Refining works with the local fire departments to offer training and contribute resources.

Volunteerism

Chalmette Refining Oaks Club: The Oaks Club is the refinery's employee volunteer organization. Activities include hands-on outreach initiatives such as community/school beautification, educational programs, American Cancer Society Relay for Life, United Way, food and coat drives, etc. Membership is

currently comprised of approximately 150 employees and contractors who volunteer their time both on and off the job.

Support of Local Education

Chalmette Refining also supports a multitude of programs and activities in neighboring schools. Believing that education is one of the most important elements of a thriving community, education is promoted through a wide variety of avenues. In addition, Chalmette Refining received the 2005 Distinguished Partners in Education Award presented by the Louisianan Department of Education.

Louisiana Nature & Science Center (LNSC) Environmental Education Program: Targeted for 4th and 5th grade students and their teachers, the LNSC program serves the environmental science requirement for St. Bernard and Orleans Parish students by incorporating field trips, school visits and projects.

Elaine P. Nunez Community College: Chalmette Refining supports the College High School Outreach program designed to allow academically advanced high school students an opportunity to earn college credits. Furthermore, the Elaine P. Nunez Community College, in conjunction with the local Workforce Investment Act office, coordinates the refinery's Green Team program, in which high school students gain summer employment in community beautification projects while earning college credit at the Elaine P. Nunez Community College.

Jefferson Performing Arts Society (JPAS): Through the JPAS, middle school students at the local alternative school have the opportunity to interact with artists and obtain an awareness of the arts. The program sponsored by Chalmette Refining, Cultural Crossroads, seeks to put students in an educational setting and teach them appropriate academic and social skills through an arts-infused education program.

New Orleans Ballet Association (NOBA): Students who otherwise would not have an opportunity to study ballet are offered after-school lessons at a local elementary school. Two performances are held each year.

St. Bernard Parish Schools: The refinery is the founding sponsor of the St. Bernard Parish Children Youth and Show Chorus, the Drug-Free Schools program, Terrific Kids (a self-esteem program for students), and Academic Games. Other student-centered activities sponsored by the refinery include Art in April (student artwork exhibition), Job Shadow Day, Reading is Fundamental, and Project Prom Safety.

Rosenwald Elementary: A business partnership has been established with an elementary school in the Lower Algiers community. Programs implemented at the school include LNSC Environmental Science and NOBA creative dance. The

refinery also sponsors an annual beautification project. The refinery also provides the students with school supplies and hosts an annual holiday assembly.

Lower Algiers Senior Center: A business partnership has been established with the Senior Center in Lower Algiers. The refinery has donated computers to the Center that are used to provide computer training to the members. The computers are also used for the Center- sponsored after-school tutoring program that provides educational support to children grades 1-12 in the Lower Algiers area. An annual holiday celebration is also held where members and refinery volunteers join in fellowship together by sharing lunch, playing games, and singing carols.

New Orleans Recreational Department (NORD) Playgrounds: The refinery has an established partnership with the NORD Cut-Off Playground, in the Lower Algiers area. The refinery is the lead sponsor of the Annual Cut-Off Playground Walk-A-Thon and provides general support through the donation of equipment and other playground needs. In addition, the refinery sponsors and participates in the Cut-Off Playground annual banquet.

Local Board Memberships

Refinery managers and employees sit on numerous area boards, including the Kiwanis Foundation, Rotary Club, Chamber of Commerce, Economic Development Commission, United Way Advisory Board and Campaign Cabinet, Safe and Drug-Free Schools, and the Elaine Nunez Community College.

Community Advisory Councils

Two Community Advisory Councils (CACs) are in place. One for the St. Bernard Parish community and one for the Lower Algiers community across the Mississippi River from the refinery. Each meets with the Refinery Manager, Public Affairs Office, and other key personnel on a monthly and bi-monthly basis respectively. Agendas are set jointly by council members and refinery representatives. The purpose of the CAC is to provide vehicles to maintain open lines of communications between the community and the refinery. The CAC's are also relied upon to provide feedback on community programs, guidance on outreach activities, and serve as a resource to better understand the communities in which we operate and live.

Plant Tours

Requests for plant tours are handled by the Public Affairs office. Groups include students, civic organizations, Chamber of Commerce members, School Board members, etc.

Measuring Effectiveness

In addition to assessing the community's perceptions of the refinery via a formal survey, Chalmette Refining continuously obtains feedback about the outreach programs through both of the CACs and program recipients. Measurement of effectiveness is an ongoing process via interacting with key public personnel (teachers, parents, students, administrators, etc.).

A. How was it determined that this facility was needed?

The equipment in the FCC-ALKY Units as well as the proposed projects are currently operated to support the refinery by upgrading feed by cracking heavy hydrocarbon molecules into lighter, more desirable hydrocarbon molecules suitable for use as motor gasoline or diesel blending components. This unit also combines low molecular weight olefins with isobutene to produce gasoline components of a higher octane rating. The proposed project will reduce nitrogen oxide compounds emitted to the atmosphere through the regenerator vent.

B. What will be the positive economic effects on the local community?

Operation of the FCC-ALKY Units as well as the proposed projects continue to provide an economic stimulus to Chalmette and the surrounding communities. Approximately 50-60 equivalent full-time positions are required to operate and maintain the equipment. These positions are currently filled with applicants from the local labor pool. Wages are estimated to be about $2-4 million and provide Chalmette and surrounding communities with income for local workers or those workers commuting to the refinery. Assuming a multiplier of 2 (as recommended by the U.S. Chamber of Commerce for urban areas), the total income of the region would be $4-8 million over the income levels that would be present if the facility was not in operation. This estimate does not include local income associated with purchases of replacement equipment and services required for the equipment.

C. What will be the potential negative economic effects on the local community?

The FCC-ALKY Units as well as the proposed projects are located in an existing industrial facility and is not expected to reduce property values in the local community. No impacts are anticipated for public costs (such as police and fire protection, medical facilities, etc.) since the facilities are located within the existing refinery. Additionally, no additional roads will be required.

D. Was transportation a factor in choosing the proposed site?

No. Chalmette Refining is an existing facility and the FCC-ALKY Units as well as the proposed projects are within this facility.

1. **What mode(s) of transportation will be used for the site?**

   The site will be accessed by existing roadways that traditionally have been used to reach the Chalmette Refinery. The facility can be accessed from the North via Interstate 510 (Paris Road), and from the East or West via Louisiana Highway 46 (St. Bernard Highway) or Highway 39 (Judge Perez Drive).

2. **What geographical area will it serve?**

   Chalmette Refining typically distributes its products throughout the United States.

3. **By how much will local road traffic volume increase?**

   There will be no increase in local traffic since the facilities are currently in operation and have been for a number of years. The main access to the site is primarily Interstate 510, which can handle the traffic and weight of the heavy vehicles.

4. **What are the long-term expectations of the proposed site?**

   (a) **Longevity of the facility**
   (b) **Who owns the facility?**
   (c) **Do others financially back the owners?**
   (d) **When is closure anticipated?**
   (e) **Who is responsible for the site after closure?**
   (f) **What assurances will there be that the site will be closed in accordance with the plan?**
   (g) **What financial assurances will be established to demonstrate the ability to handle problems after closure?**
   (h) **Who certifies that the site is properly closed?**
   (i) **How are people protected from unwittingly buying land after closure?**

   This question appears to be directed toward a waste management facility and is, therefore, not applicable to the FCC-ALKY Units or the proposed projects. No waste management facilities will be installed. All current waste management activities are regulated by EPA and LDEQ hazardous and solid waste regulations.

III. **Are there alternative projects that would offer more protection to the environment than the proposed facility without unduly curtailing non-environmental benefits?**

No. This is an existing facility and the proposed modifications associated with the proposed projects will enable Chalmette Refining to reduce emissions of nitrogen oxide compounds.

A. Why was this technology chosen?

The technology chosen allows Chalmette Refining to reduce emissions of nitrogen oxide compounds from the regenerator in accordance with agreements between the refinery and regulatory authorities.

1. Are other technologies available?

Other technologies are available. However, the technology selected for the FCC-ALKY Units as well as the proposed projects are best suited for the existing refinery and minimizes environmental impacts.

2. Describe the engineering design and operating techniques used to compensate for any site deficiencies.

There are no actual site deficiencies. The equipment in the FCC-ALKY Units as well as the proposed projects is designed to be protective of the environment.

B. Is the proposed technology an improvement over that presently available?

Yes, the technology selected for reduction of nitrogen oxides in the regenerator vent is a patented process that has been used in over 80 locations around the world. The technology will reduce nitrogen oxide emissions by over 200 tons per year.

C. Describe the reliability of technology chosen.

1. Past experiences

CRLLC has identified the selected technology reliability through process knowledge and process experience from similar facilities.

2. Environmental Impacts

The control technology is designed to minimize impacts to the environment. No significant impacts to the air, land or water are anticipated.

D. Describe the sequence of technology used from arrival of wastes to the end process at the facility (flow chart).

1. **Analysis of waste**
2. **Unloading**
3. **Storage**

4. **Treatment**
5. **Monitoring**
6. **Closure**
7. **Post-closure**
8. **Disposal**
9. **Any residuals requiring further handling**

This question, which relates to technology employed at a waste management facility, is not applicable to the FCC-ALKY Units as well as the proposed projects.

E. Will this facility replace an outmoded/worse polluting one?

No. Currently installed control technologies will be utilized in the FCC-ALKY Units.

F. What consumer products are generating the waste to be disposed? Are there alternative products that would entail less hazardous waste generation?

Generally, the FCC-ALKY Units as well as the proposed projects do not generate significant quantities of waste at the Chalmette Refining. All practicable steps will be taken to minimize waste generation due to operation of the FCC-ALKY Units.

IV. Are there alternative sites that would offer more protection to the environment than the proposed facility site without unduly curtailing non-environmental benefits?

No.

A. Why was this site chosen?

Chalmette Refining has operated at the present location for many years, and the FCC-ALKY Units have been a part of those operations. The proposed projects will utilize existing refinery equipment.

1. Specific advantages of the site

The proposed site offers the following advantages:

- Chalmette Refining is an existing facility;
- The site already has the necessary infrastructure to support the operation of the proposed projects as well as existing facilities;
- There will be no new highway, onsite or offsite construction required as a result of the FCC-ALKY Units as well as the proposed projects;

- Since the boundaries of the FCC-ALKY Units as well as the proposed projects are within the existing refinery, there are no re-zoning issues to be resolved;
- The area in and immediately adjacent to Chalmette Refining is heavily industrialized; the areas to the east and west are also heavily industrialized; the area to the north contains residential areas;
- Feed, fuel and supplies can be readily received at the site via existing facilities;
- There is direct access to rail service; and
- The site is not in the 100-year floodplain.

2. **Were other sites considered and rejected?**

   No. As previously noted, Chalmette Refining is an existing facility.

3. **Is the location of the site irrevocable; i.e. would denial of permit based on site preclude the project?**

   Yes. The FCC-ALKY Units as well as the proposed projects are specific in nature and design for Chalmette Refining. Again, Chalmette Refining is an existing facility.

B. Is the chosen site in or near environmentally sensitive areas?

1. **Wetlands**
   The FCC-ALKY Units as well as the proposed projects are located at Chalmette Refining, which is a developed industrially-zoned area. There are no wetlands located at the facility.

2. **Estuaries**

   The FCC-ALKY Units as well as the proposed projects are located at Chalmette Refining, which is a developed industrially-zoned area. There are no estuaries located at the facility.

3. **Critical Habitat**

   The FCC-ALKY Units as well as the proposed projects are located at Chalmette Refining, which is a developed industrially-zoned area. There are no critical habitats located at the facility.

4. **Historically or Culturally Significant Areas**

   The FCC-ALKY Units as well as the proposed projects are located at Chalmette Refining, which is a developed industrially-zoned area. The

refinery is located in an area that is historically significant and is adjacent to the Chalmette National Park.

C. What is the zoning and existing land use of the prospective site and nearby area?

The FCC-ALKY Units as well as the proposed projects are located at Chalmette Refining, which is zoned as industrial property.

1. Is the site located near existing heavy industrial, chemical process or refinery operations?

Yes. The FCC-ALKY Units as well as the proposed projects are located at an existing industrial facility, Chalmette Refining.

2. Is there a precedent for chemical contamination near the site or is the soil and water pristine?

Chalmette Refining has completed a site-wide RCRA Facility Investigation (RFI) to determine the subsurface conditions at the refinery. The findings of the RFI are currently under review by the USEPA and LDEQ. The refinery is located in an area that has been used for heavy industrial operations since the early 1900's. As may be expected from a facility that has been in existence for that length of time, the soil and water in the area cannot be considered pristine.

3. Is the area particularly noted for its aesthetic beauty?

The FCC-ALKY Units as well as the proposed projects are located within an existing industrial area.

D. Is the site flood prone?

1. Is the site in a flood plain?

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) for St. Bernard Parish confirm that the area does not lie within the 100-year flood plain. Site-specific diking is provided from a hundred-year flood by the levee system along the Mississippi River.

2. Is the site hurricane vulnerable?

The refinery, as well as the majority of south Louisiana, is subject to seasonal adverse weather effects such as hurricane-force winds and heavy rains. The location of the protection levees of the Mississippi River and Lake Pontchartrain may protect Chalmette Refining from storm surge and wave

action due to hurricanes. However, the facility is designed to withstand hurricane force winds.

As part of the Refinery's Emergency Response Procedures, a Hurricane Preparedness Plan is maintained. General preparedness actions are taken year round, and specific actions are taken at the start of hurricane season and when storms are approaching. Refinery preparations are communicated to and coordinated with local and state emergency planning and response agencies.

E. Is groundwater protected?

1. Are aquifers or recharge areas underlying the site used for drinking water?

Chalmette Refining and much of the surrounding area obtain drinking water from the Mississippi River, due to the relatively poor quality of groundwater attributed to high levels of chlorides or objectionable color.

The generalized regional hydrogeology is characterized by a series of alternating aquifers and aquitards. Fresh water aquifers (i.e., where the chloride concentration is less than 250 mg/L) on a regional basis can occur within the first 1,200 ft below ground surface (bgs). They are named according to the approximate depth at which they are found. These aquifers are the "100-Foot Sand", "200-Foot Sand", "400-Foot Sand", "700-Foot Sand", and the "1,200-Foot Sand".

The groundwater table typically occurs in the shallow natural levee deposits (silty clays), within ten feet of the ground surface. Underlying the 15-40 feet thick levee deposits is a fairly continuous, fine sand to silty fine sand unit which is known as the "100-Foot Sand". The "100-Foot Sand" may extend to depths of 150 feet or more. At Chalmette Refining, an interbedded unit may be present within the "100-Foot Sand". Where this occurs at the refinery, the sand above these clay units has historically been referred to as the "40-Foot Sand", while the sand below the clay units is referred to as the "100-Foot Sand". Based on additional geologic investigations completed during the RFI, the "40-Foot Sand" has been renamed the "Upper Sand Unit" and the "100-Foot Sand" has been renamed the "Lower Sand Unit".

Individual sand deposits are discontinuous and have relatively low permeability and yield rates (Rollo 1966). The highest known yield of a well in the point bar deposits is 50 gallons per minute (gpm) from a well in Orleans Parish that consists of sand much coarser than found in typical point bars.

The "200-Foot Sand" exhibits poor water quality due to generally brackish conditions (i.e. chloride concentrations are greater than 250 mg/L). In eastern New Orleans, the water quality exceeds 250 mg/L or chloride. The concentration of chloride is expected to increase in the south and east

direction, from New Orleans toward St. Bernard, approaching the Gulf of Mexico. The only local areas where fresh water (chloride concentrations of less than 250 mg/L chloride) occurs in the "200-Foot Sands" are in the northwest corner of Jefferson Parish. At the refinery, the "200-Foot Sand" is present as two, 10- to 15-foot thick sands at depths of 200 and 260 ft bgs (termed the "200 and 250-Foot Sands"). Investigations of these sands at the refinery indicated these zones have low permeability (less than 0.1 ft/yr) and Total Dissolved Solids (TDS) levels of 4,900 mg/L.

Interbedded clays and clayey sands or silts separate the "200-Foot Sand" from the "100-Foot Sand". The USGS considers the "200-Foot Sand" aquifer to be a zone of water bearing sands rather than a single sand.

The "400-Foot Sand" (Harris, 1904) underlies Jefferson Parish and northwestern Orleans Parish, and has an increasing clay content toward St. Bernard Parish. Very little use is made of this groundwater zone other than for stock purposes, since it is generally brackish (250 to 500 mg/L chloride). In the vicinity of the refinery, only one well (JF-57) is completed in this sand, and has a chloride concentration of 870 mg/L (Rollo, 1966).

The "700-Foot Sand" is separated from the "400-Foot Sand" by 50 to 60 feet of stiff marine clay. The "700-Foot Sand" is the principal aquifer in the New Orleans area. Water wells were drilled into this aquifer as early as 1854 for public drinking supply and it was used locally until the early 1900's. Several industries in the area continue to use the "700-Foot Sand" water for cooling purposes. The thickness of the 700-foot aquifer ranges from 62 to 338 feet in the New Orleans area and averages about 175 feet. In the vicinity of the refinery, the "700-Foot Sand" is comprised of three sand zones from 525 to 750 feet. The thickest sections are southwest of downtown New Orleans and the feature thins to the north and east toward St. Bernard. The Michoud Electric Power Plant, located approximately 5.8 miles northeast of the refinery, is the largest user of water from the "700-Foot Sand". It pumps as much as 13,000 gpm, creating a wide cone of depression influencing the groundwater flow throughout the area. The permeability averages about 3.9 x 10^2 cm/sec. The quality of the water in the "700-Foot Sand" is not considered satisfactory for public supply, due primarily to its characteristic yellow color. The origin and occurrence of this color is not well understood, but it may originate as the water leaches decaying vegetation or passes through peat or other plant remains. In the Chalmette area, the water in the "700-Foot Sand" is brackish quality (i.e., greater than 250 mg/L chloride), but falls within the U.S. EPA classification of potentially usable (less than 10,000 mg/L TDS).

The "1,200-Foot Sand" occurs from 925 to 1,015 ft bgs and is separated from the "700-Foot Sand" by approximately 100 feet of clay and other strata. The "1,200-Foot Sand" is not currently used as a source of groundwater in the New Orleans area, principally because of its poor water quality and the availability of treated water from the Mississippi River. The USGS reports

historical use of this water in the early 1900s, because the flowing artesian pressure of this zone was greater than that of the "700-Foot Sand". This indicates that the "1,200-Foot Sand" recharges a portion of the "700-Foot Sand". Below the "1,200-Foot Sand" are a series of sand units, the "1,900-Foot Sand", "2,400-Foot Sand", and "2,700-Foot Sand", that have been used for waste disposal/injection purposes due to the low permeability clay that separates them from the shallower sands. Approximately 270 feet of silt and clay, along with the other strata, separate the "1,200-Foot Sand" from the "1,900-Foot Sand".

2. What is the relationship of the site to the water table?

Water level measurements collected at the site from the water table wells (MW-2 through MW-26) indicate that the water table is present at a depth of approximately one to three feet below land surface. This first groundwater zone is not used as a potable water source.

3. What wells exist in the area?

An inventory of registered wells was obtained from the Louisiana Department of Transportation and Development (LDOTD) for Chalmette Refining's Township (12S) and Range (12E). A total of 176 wells were indicated in the LDOTD database. Of these wells, 97 wells were listed as plugged or abandoned, 71 wells were listed as monitoring, 6 wells were listed as industrial, and 2 wells were listed as unknown. All wells listed as industrial are deeper than 750 ft.

An inventory of current on-site wells was obtained from Chalmette Refining. There are a total of 69 wells located at the refinery, which are primarily used for groundwater monitoring. Of the wells, 36 are Water Table Wells (screened in the first groundwater zone), 19 are screened in the Upper Sands Unit, and 14 are screened in the Lower Sands Units.

There are no drinking water wells in the area.

4. What is the flow rate and direction of the groundwater flow?

Water levels were collected from the site-wide network water table wells on a monthly basis from September 1997 to August 1998. For each round of water level data collected, a water table elevation map was prepared. The water table maps constructed through August 1998 show that groundwater flow of the water table is, overall, to the north away from the Mississippi River.

In the vicinity of the Mid East Tank Farm (METF) and northeast corner of the Main Processing Area (MPA), groundwater flow is to the east. A groundwater divide, located in the central portion of the site, extends from

Well MW-3 eastward for several thousand feet and then northward in the vicinity of Well MW-19.

The water table elevation maps indicate that in the fall and winter months, the Mississippi River stage was lower than the water levels observed in monitoring wells immediately adjacent to the Mississippi River. It appears that the water levels in the monitoring wells immediately adjacent to the natural levee rise and fall with the river stage, but groundwater flow reversals have not been observed. The water level data are consistent with a groundwater divide present at the natural levee.

Flow Rate

Slug tests were conducted on various monitoring wells, and the data were used to calculate hydraulic conductivities for the water table zone. Hydraulic conductivity values ranged from 0.004 ft/day to 0.174 ft/day and averaged 0.0645 ft/day.

A groundwater flow rate for the water table zone was calculated utilizing Darcy's Law:

$$\bar{v} = \frac{K \times dh/dl}{n}$$

where:

$\bar{v}$	=	average linear velocity
dh/dl	=	hydraulic gradient
n	=	effective porosity
K	=	hydraulic conductivity

Utilizing the water table maps, an average hydraulic gradient of 0.006 ft/day was calculated for the water table zone. Driscoll (1986) indicates that the specific yield for sand ranges from 10 to 30 percent. Using specific yield as an estimate for effective porosity, 0.2 represents a rough mean of this estimate. Therefore, a value of 0.20 was utilized for effective porosity in the flow rate calculations. Utilizing the values referenced above, a groundwater flow rate for the water table zone was calculated as 0.71 ft/year (ft/yr).

5. What is the groundwater quality in the underlying aquifers?

Please refer to Question IV.E.1 for a discussion of the hydrogeological conditions.

6. Is there a hydraulic connection between the aquifers?

A previous investigation indicates that there is a hydraulic connection between the sand units of the point bar depositional sequence (Upper and Lower Sands Units). Hydraulic connections between the deeper aquifers were not investigated.

F. Does prospective site pose potential health risks as defined by proximity to:

1. Prime agricultural area (crop or pastureland)

There are no prime agricultural areas located in the vicinity of Chalmette Refining.

2. Residential area

There are residential areas located in the suburbs of Meraux northeast of State Highway 46 (St. Bernard Highway) and Chalmette Vista north and northwest of State Highway 46. Chalmette Refining minimizes risks to local residences by providing appropriate engineering safeguards to control refinery processes.

3. Schools or Day Care Centers

Schools located in the vicinity include Nunez Community College, Chalmette High School, Chalmette Middle School, Meraux Elementary, Rowley Elementary, Our Lady of Prompt Succor School, and LaCoste Elementary. Chalmette Refining minimizes risks to these public establishments by providing appropriate engineering safeguards to control refinery processes.

4. Hospitals or Prisons

Hospitals located in the area include Chalmette Medical Center, located approximately 1.5 miles from Chalmette Refining. There is also a prison located approximately 0.1 miles east of the refinery. Chalmette Refining minimizes risks to these facilities by providing appropriate engineering safeguards to control refinery processes.

5. Public Buildings or Entertainment Facilities

Public buildings located near Chalmette Refining include a library and a courthouse. Both facilities are located on St. Bernard Highway, north of the refinery. Chalmette Refining minimizes risk to these public establishments by providing appropriate engineering safeguards to control refinery processes.

6. Food Storage Area

There are no food storage areas located in the vicinity of Chalmette Refining.

7. **Existing community health problems that may be aggravated by operation of additional hazardous waste disposal capacity**

   Not applicable. Chalmette Refining is not a hazardous waste treatment or disposal facility.

G. Is air quality protected?

1. **Is the site within an ozone or non-attainment area?**

   St. Bernard Parish is attainment for all pollutants.

2. **What contaminants are likely to be generated at the site?**

   Criteria pollutants (CO, PM_{10}, SO_2, NO_x, and VOC) are generated by Chalmette Refining, along with LDEQ-regulated toxic air pollutants. Pollutants from the FCC-ALKY Units are currently included in the emissions from the refinery.

3. **What protection is afforded from each contaminant generated by the site?**

   Emissions of these compounds are controlled to the maximum extent practicable using containment, efficient burners and clean burning fuels for combustion, a patented nitrogen oxide reduction system, and a wet scrubber.

4. **What is the potential for unregulated emissions?**

   Unregulated emissions are controlled to the maximum extent practicable using the controls discussed in Question IV.G.3. In the event of an emergency, potential releases would be controlled using the on-site flare.

5. **What plans are implemented to provide for odor control?**

   There are no significant potential for odors or need for odor control from the FCC-ALKY Units as well as the proposed projects.

6. **Who will be affected by emissions?**

   a. **What is the direction of the prevailing winds?**

      Prevailing winds are anticipated to be influenced by the Gulf Stream. Therefore, prevailing winds are anticipated to be primarily from the South. However, wind directions are variable based on the time of the year since cold fronts occurring in the fall and winter will frequently cause North and Northwest winds.

b. Describe the expected frequency of "bad air" conditions.

"Bad air" conditions are not expected to increase as a result of the operations of the FCC-ALKY Units as well as the proposed projects.

7. Describe the control of vapors at various stages of process.

Vapors are controlled to the maximum extent practicable throughout all refinery processes including use of Maximum Achievable Control Technology for controlling equipment leaks.

H. Have physical site characteristics been studied? What has been done in terms of a geotechnical investigation?

1. **Site geology**
2. **Hydrology**
3. **Topography**
4. **Soil properties**
5. **Aquifer location**
6. **Subsidence problems**
7. **Climatic conditions**

Please refer to responses to Question IV.E.1 through IV.E.6 for a discussion of the geotechnical data requested.

The climate of southeastern Louisiana is subtropical. During the past 100 years, an average of 120 days of measurable rain per year occurred in the area, with the annual rainfall amount averaging 60.44 inches. A fairly consistent rainy period occurs from mid-December through mid-March. Two fairly definite dry periods occur in the early spring and early fall months. The area is also prone to hurricanes and tropical storms during the late summer and early fall months.

V. Are there mitigating measures which would offer more protection to the environment than the facility as proposed without unduly curtailing non-environmental benefits?

(This question requires the permittee to demonstrate having considered the most stringent techniques for reducing or more efficiently handling waste.)

No.

Chalmette Refining is committed to complying with all environmental regulations and being a good neighbor in the community. Chalmette Refining is dedicated to continuous improvement of the compatibility of refinery operations with the environment while providing high quality products that meet customer and consumer needs. Chalmette Refining recognizes the importance of efficiently

meeting society needs while responsibly working with the public and government to protect human health and the environment.

A. Is this facility part of master plan to provide waste management? Whose plan?

1. **How does it fit into the plan?**
2. **What geographical area is served by the plan?**

B. Does this facility fit into an integrated waste management system? (reduction, recovery, recycling, sales tax, exchange, storage, treatment, disposal).

1. **On-site**
2. **Regional**

C. Can waste be disposed in another fashion (way)?

1. **Technology limitations**
2. **Cost factors**
3. **Other reasons**

D. What quality assurance control will be utilized to protect the environment?

1. **Plans for lab work**
2. **How are out-of-spec wastes handled**
3. **What happens to rejected wastes**
4. **Treatment stabilization**
5. **Segregation of non-compatible wastes**
6. **Handling of containerized wastes**

E. Innovative techniques used to control release of waste or waste constituents into the environment.

1. **Surface impoundment**
2. **Land application treatment**
3. **Landfill (burial)**
4. **Incinerator**
5. **Container storage**
6. **Tanks**

These questions appear to be addressed to a waste management facility and are thus not applicable to the FCC-ALKY Units as well as the proposed projects.